AD-A163 462 WARRANTED HANDTOOLS FOR TRANSPORTATION VEHICLE MAINTENANCE(U) AIR FORCE LOGISTICS MANAGEMENT CENTER GUNTER AFS AL K R DALTON ET AL. OCT 85 1/1

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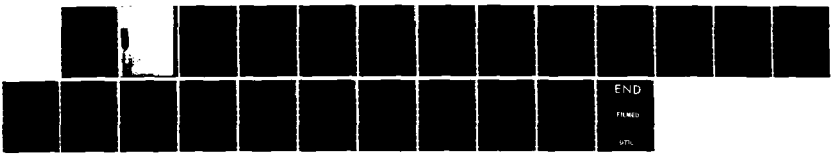

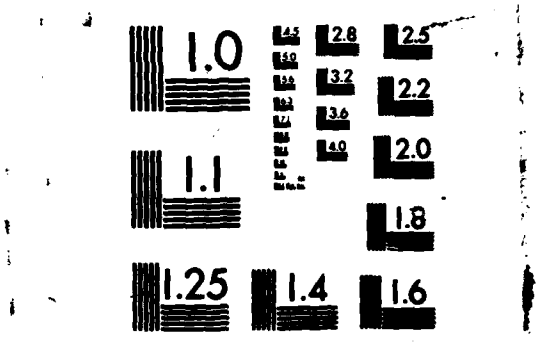


MICROCOPY RESOLUTION TEST CHART
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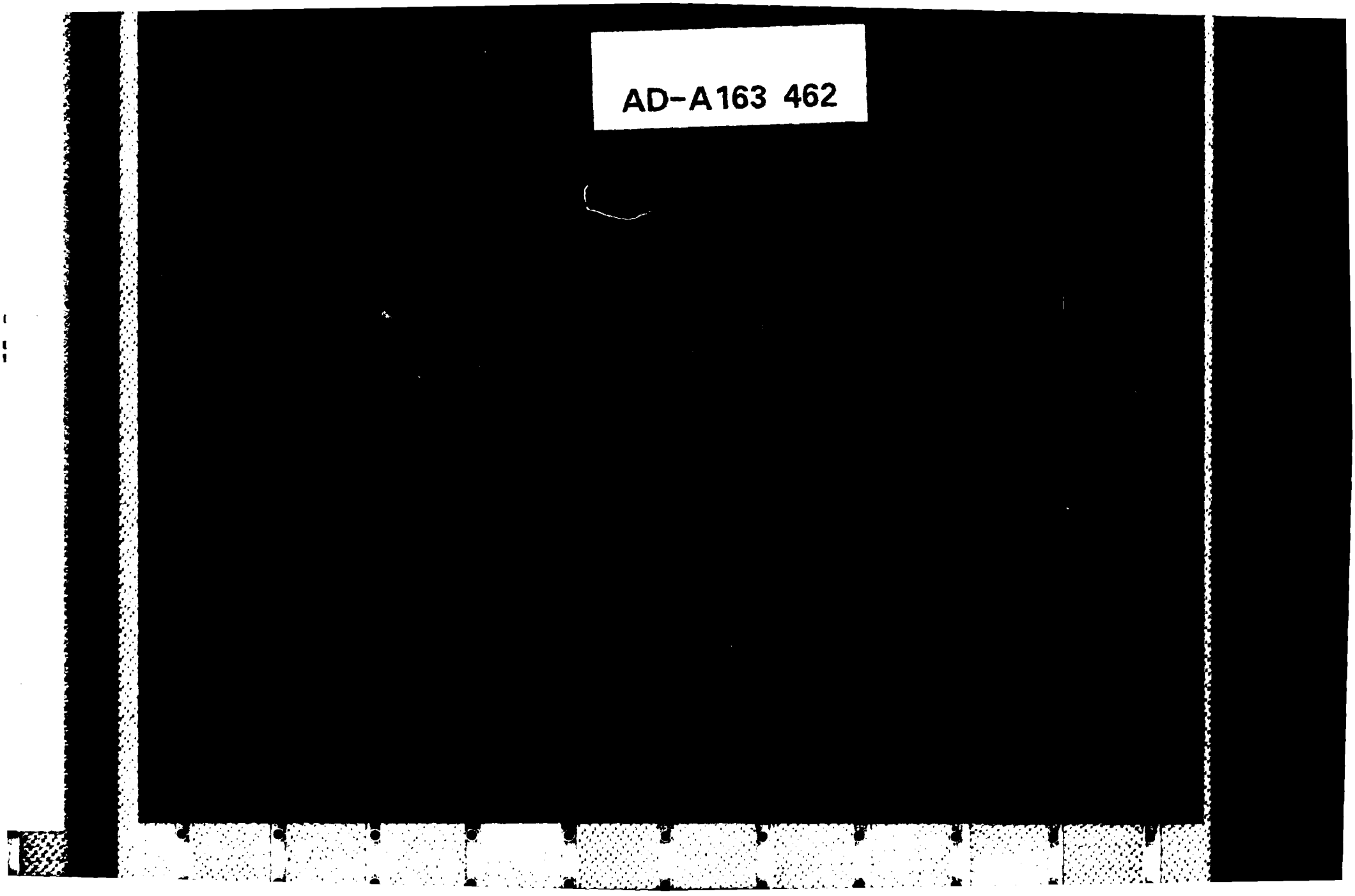

## ABSTRACT

The objective of this study was to evaluate vehicle maintenance handtool breakage rates to determine if procuring warranted handtools would be economically beneficial. We evaluated GSA tool failure rates at 12 selected bases over a 6-month period. Using the same analytical procedure as a previous aircraft maintenance study, we found tool breakage rates in vehicle maintenance to be significantly less than in aircraft maintenance. Vehicle maintenance tool breakage data does not economically justify including transportation in the warranted handtool program.

## EXECUTIVE SUMMARY

HQ USAF/LET tasked the AFLMC to initiate a project to determine the cost effectiveness of procuring long-term warranted handtools to help eliminate reported problems with deficient, poor quality tools in vehicle maintenance.

A previous LMC study proved warranted handtools for aircraft maintenance was economically beneficial. Vehicle mechanics claimed their tools had the same problem: a high breakage rate due to poor design, weak metal, or plastic parts; loss of productivity, time, and effectiveness when tools break, and ultimately reduced morale.

This study evaluated GSA tool failure rates at 12 selected bases in 6 MAJCOMS. Data was collected over a 6-month period beginning December 1984. The field evaluation measured tool failures and losses for 309 selected high-use tools in vehicle maintenance. We then performed an analysis to determine if the use of warranted tools in vehicle maintenance would result in an economic savings to the Air Force.

The conclusion of our evaluation revealed a 3.3 percent breakage rate for GSA tools compared to the 25 percent rate found in the aircraft maintenance study. At a 4 to 1 cost ratio of warranted tools to GSA tools, the cost comparison payback rate for the 3.3 percent breakage in vehicle maintenance exceeds 30 years compared to 3.8 year payback found for aircraft maintenance. Thus, breakage rates and ultimate cost savings to the Air Force do not justify purchasing warranted handtools for vehicle maintenance.

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# CHAPTER 1

# THE PROBLEM

## BACKGROUND

This project is similar to a previous AFLMC study, WARRANTED TOOLS FOR AIRCRAFT MAINTENANCE (6). The Aircraft Maintenance study demonstrated normal handtools procured through GSA had a high breakage rate when used in jet engine shops and recommended the use of higher quality tools with a lifetime warranty. Field tests of warranted tools showed dramatically reduced breakage rates, and a payback of under 4 years. Although the warranted tools were initially more expensive, they saved money in the long run. Vehicle mechanics at base level believe the need exists for the same quality tools in transportation. The objective of this project was to determine whether or not warranted tools would be cost effective in vehicle maintenance.

## PROBLEM STATEMENT

Vehicle mechanics report experiencing high levels of tool failure with standard GSA tools. They expressed concern about the tools failing due to poor quality; some tool failures have caused personal injury. These failures and injuries have caused user frustration. When tools break and cannot be readily replaced, this lost time costs the Air Force valuable manhours.

## FACTORS BEARING ON THE PROBLEM

1. ASSUMPTIONS:

a. The primary criterion to determine implementation of warranted tools is replacement costs compared to failure rates of broken tools.

b. The sample for the field evaluation was representative and the sample size was sufficient to form a basis for economic analysis.

c. Bases reported all GSA tool losses and failures to the AFLMC using the monthly collection forms provided.

## CHAPTER II

## DEVELOPMENT

### APPROACH

The objective of this project was to evaluate vehicle maintenance handtool breakage rates to determine if procuring warranted tools would be economically beneficial.

The placement of warranted tools in aircraft maintenance was determined by a field evaluation comparing 72 selected warranted tools with comparable GSA tools. Analysis of breakage rates from the evaluation gave Aircraft Maintenance a 3.8 year payback for warranted tools. We opted to perform the same analysis in our vehicle maintenance shops, but budgetary constraints would not allow us to field test warranted tools. It was more economical to evaluate the GSA tools presently being used and compare those failure rates to the data developed in the aircraft maintenance study. To determine the tools for the evaluation, we used tool-issue rates from our supply data banks and information supplied by the bases we worked with. From this data we selected 309 high-use tools (see Table 2). We determined a 6-month field evaluation at a minimum of 10 bases would be sufficient to obtain the data needed. Six MAJCOMS, MAC, TAC, SAC, AAC, PACAF, and USAFE were contacted for test bases; we began our evaluation with 12 bases (see Table 1).

Evaluation packages were sent to the 12 bases so vehicle mechanics could document tool failures. We received data on inventory, breakage and losses on the 309 high-use tools and analyzed this data for annual tool failure percentages. GSA tool failure rates in vehicle maintenance were then compared to those found in the aircraft maintenance study.

### RESULTS

The evaluation revealed the percent failure rate for the 309 tools was 3.3 percent. The economic payback formula uses many factors to determine the payback period. It uses, in addition to the annual failure rate, cost of both the warranted and non-warranted items, cost of replacement transactions, method of replacement (on-base vs off-base), inflation, discounts, etc. However, it can be approximately expressed as follows: to obtain a 4 year payback, a tool must exhibit a 25% annual failure rate if the cost differential of the warranted versus non-warranted to is 4 to 1. The failure rate of 3.3 percent (approximately 1/8 that of aircraft maintenance) would equate to a payback period in excess of 30 years.

There were two tool groups with failure rates of 10 and 11 percent, rates high enough to suggest taking a hard look at the quality of tools being issued in these two tool groups. These tools and failure rates are listed in Tables 3 & 4.

Although tool control procedures were not specifically addressed in this report, the .1 percent loss rate found in this study indicates present tool control methods are effective.

## CHAPTER III

## CONCLUSIONS

We determined a 3.3 percent failure rate for GSA tools, compared to the 25 percent found in aircraft maintenance, will not justify purchase of warranted tools. Based on a 4 to 1 cost ratio of warranted tools to GSA tools, it is not economically beneficial to purchase warranted tools in vehicle maintenance.

We did find two tool groups with relatively high failures (Tables 3 & 4). These two groups of tools need to be watched by maintenance shops and failures reported using the Material Deficiency Reporting (MDR) system. Since these tools have a high potential for abuse/misuse, vehicle maintenance supervisors should stress their proper utilization and continue to monitor breakage frequency of these tools.

## CHAPTER IV

## RECOMMENDATIONS

1. Recommend vehicle maintenance continue using GSA tools. Based on the data received from the field evaluation, our current tool procurement system is more cost effective than buying warranted handtools. (OPR: HQ USAF/LETN)

2. Recommend MAJCOM/LGT's publicize our findings and encourage bases to document through the Material Deficiency Reporting (MDR) system tool failure not attributed to normal wear, abuse, or misuse. We recognize GSA tools are obtained from many sources, with manufacturer, lot number, stock/part number, etc., often unavailable. MDRs however, should be submitted for each tool failure giving as much information about the item as possible. This is the only way we can ensure the item manager is notified of tool quality deficiencies. (OPR: MAJCOM LGTs)

3. Additionally, we recommend vehicle maintenance maintain the current tool control methods. Present tool control, based on loss rate data from the evaluation, seems to be working in transportation. (OPR: MAJCOM LGTs).

## PARTICIPATING BASES AND COMMANDS

60 MAW, Travis AFB, Ca (MAC)

317 TAW, Pope AFB, NC (MAC)

90 SMW, F. E. Warren AFB, Wy (SAC)

44 SMW, Ellsworth AFB, SD (SAC)

23 Trans, England AFB, Fl (TAC)

56 Trans, MacDill AFB, Fl (TAC)

347 Trans, Moody AFB, Fl (TAC)

401 TFW, Torrejon AB, Sp (USAFE)

513 TAW, RAF Mildenhall, Uk (USAFE)

313 AD, Kadena AB, Ja (PACAF)

3rd TFW, Clark AB, RP (PACAF)

21 TFW, Elmendorf, Ak (AAC)

TABLE 1

Transportation Tool Project - Inventory Consumption Rate Summary

| Stock Number | * Number Authorized | **Predicted Ann. Flrs. | ***Annual Inv. Consumed (%) | Nomenclature |
|---|---|---|---|---|
| 5120002439703 | 649. | 38.4 | 5.9 | Adapter, Socket Wrench, 1/2" Sq Male End, 3/8" Female End |
| 5120002439702 | 627. | 19.6 | 3.1 | Adapter, Socket Wrench, 3/8" Sq Male End, 1/2" Female End |
| 5120002241189 | 619. | 40.6 | 6.6 | Bar, Pry 17/32" Dia., 15" to 16" lg |
| 5120002930319 | 9d. | 4.8 | 4.9 | Bender Set, Tube, Hand |
| 5120002401532 | 447. | 2.4 | 0.5 | Extension, Socket Wrench, Flex, 1/4" sq dr, 6" long |
| 5120002278574 | 657. | 20.0 | 3.0 | Extension, Socket Wrench, 1/2" sq dr, 10" long |
| 5120002431597 | 642. | 10.4 | 1.6 | Extension, Socket Wrench, 1/2" sq dr, 2" long |
| 5120002439703 | 532. | 6.8 | 1.3 | Extension, Socket Wrench, 1/2" sq dr, 20" long |
| 5120002437326 | 632. | 17.8 | 2.8 | Extension, Socket Wrench, 1/2" sq dr, 5" long |
| 5120002431c91 | 56d. | 20.4 | 3.6 | Extension, Socket Wrench, 3/8" sq dr, 12" long |
| 5120002431589 | 645. | 0.0 | 0.0 | Extension, Socket Wrench, 3/8" sq dr, 3" long |
| 5120002278107 | 555. | 9.0 | 1.6 | Extension, Socket Wrench, 3/8" sq dr, 6" long |
| 5120002431590 | 415. | 0.0 | 0.0 | Extension, Socket Wrench, 3/8" sq dr, 8" long |
| 5120002224284 | 382. | 21.0 | 5.5 | Extractor, Cotter Pin, 6" long, CID A-A-385 |
| 5120003575153 | 349. | 4.4 | 1.3 | Extractor, Set Screw, No 1-6, 3/16-1/4", 1/4-3/4", tapered |
| 5120002262458 | 630. | 21.8 | 3.5 | Finger, Mechanical Flex, 14 7/8" reach, GGG-F-00360 |
| 5120002618341 | 604. | 29.4 | 4.9 | Hammer, Hand, Machine, Ball Peen, 8 oz |
| 5120002618343 | 656. | 31.4 | 4.8 | Hammer, Hand, Machine, Ball Peen, 16 oz |
| 5120002618346 | 589. | 38.8 | 6.6 | Hammer, Hand, Machine, Ball Peen, 32 oz |
| 5120002618340 | 474. | 22.8 | 4.8 | Hammer, Hand, Machine, Ball Peen, 4 oz |
| 5120002633345 | 299. | 38.0 | 13.1 | Hammer, Hand, Screw Insert 1" Face, 9 oz |
| 5120002622283 | 34. | 2.4 | 7.1 | Hammer, Hand, Welders, Double Bevel, 14 oz |
| 5120002732193 | 130. | 8.4 | 6.5 | Hammer, Tack, Magnetized, 5 oz |
| 5120002413143 | 425. | 0.0 | 0.0 | Handle, Socket Wrench, Sliding Tee, 3/8" sq dr, 4 1/2" long |
| 5120002387490 | 542. | 50.4 | 9.3 | Handle, Socket Wrench, 1/2" drive x 19" long, Hinged |
| 5120002305385 | 675. | 80.4 | 11.9 | Handle, Socket Wrench, 1/2" drive x 9" long, Ratchet |
| 5120002431071 | 274. | 0.0 | 0.0 | Handle, Socket Wrench, 1/2" drive, Brace 18" long (Speeder) |
| 5120002374369 | 318. | 4.0 | 1.3 | Handle, Socket Wrench, 3/8" drive, Brace 16" lg (Speeder) |
| 5120002654203 | 395. | 39.2 | 9.9 | Handle, Socket Wrench, 3/8" drive, 10 1/4" long, Ratchet |
| 5120002465364 | 654. | 123.8 | 18.9 | Handle, Socket Wrench, 3/8" drive, 6" long, Ratchet |
| 5120002465196 | 632. | 27.6 | 4.4 | Handle, Socket Wrench, 3/8" drive, 8 1/2" long, Hinged |
| 5120002333207 | 248. | 25.6 | 10.3 | Mallet, Rawhide, 11 oz. |
| 5120002933399 | 163. | 0.0 | 0.0 | Mallet, Rucher |
| 5120002419407 | 613. | 23.2 | 3.8 | Pliers, Battery Terminal, 7" |
| 5120002908044 | 515. | 15.4 | 3.0 | Pliers, Brake Spring Repair, 12" |
| 5120002308250 | 544. | 37.4 | 6.9 | Pliers, Curved, Round, Needle Nose, 6" |
| 5120002308253 | 592. | 43.0 | 7.4 | Pliers, Diagonal Cut, 6" |
| 5120002562150 | 350. | 6.0 | 1.7 | Pliers, Duckbill, 6" |
| 5120002929651 | 392. | 23.2 | 5.9 | Pliers, Retaining Ring, Ext. Brake Key |
| 5120002926253 | 173. | 7.2 | 4.2 | Pliers, Retaining Ring, Ext. Flat Jaws, 0.87"-1.00" |
| 5120002930249 | 145. | 4.8 | 3.3 | Pliers, Retaining Ring, Ext. Flat Jaws, 1.43" - 2.00" |
| 5120002663120 | 329. | 2.0 | 0.6 | Pliers, Sheet Pound, Nose/Cutter, 6" |
| 5120002760562 | 597. | 69.2 | 11.6 | Pliers, Slip Joint, Angle Nose, Straight Jaw 10" |
| 5120005373375 | 600. | 28.0 | 4.7 | Pliers, Slip Joint, Hose Clamp, 7 5/8" |
| 5120002217397 | 458. | 13.6 | 3.0 | Pliers, Slip Joint, Straight Nose/Cutter, 8" |
| 5120002860492 | 309. | 8.0 | 2.6 | Pliers, Snap Ring Set, Ext. & Int. |
| 5120002933481 | 274. | 33.6 | 12.1 | Pliers, Straight, Round, Needle Nose/Cutter, 6 1/2" |

* The number authorized indicates total tools authorized at the 12 evaluation bases.

** The predicted annual failures are the reported tool breakage/failure(s) for the 12 bases extrapolated to 12 months.

*** The annual inventory consumed percent (%) is the predicted annual breakage/failure(s) for the 12 bases compared to the total authorizations.

TABLE 2

| Stock Number | Number Authorized | Predicted Ann. Firs. | Annual Inv. Consumed (%) | Nomenclature |
|---|---|---|---|---|
| 5120002249453 | 350. | 2.4 | 0.7 | Puller, Fuse, Plier Type, 1/4" - 1/2" |
| 5120002464252 | 321. | 0.0 | 0.0 | Puller, Terminal, Battery Clamp |
| 5120002437322 | 295. | 8.8 | 3.0 | Ratchet Attachment, Socket Wrench, Rev., 1/2" sq dr |
| 5120002271207 | 121. | 0.0 | 0.0 | Ratchet Attachment, Socket Wrench, Rev., 1/4" sq dr |
| 5120002278129 | 240. | 9.2 | 3.8 | Ratchet Attachment, Socket Wrench, Rev., 3/8" sq dr |
| 5120002536579 | 289. | 7.4 | 2.6 | Remover and Setter, Stud, 1/4" - 3/4" |
| 5120002730327 | 290. | 8.0 | 2.8 | Screw Starter, Hand, 3/16" x 11 1/4" long, Type III |
| 5120002433296 | 230. | 4.4 | 1.9 | Screw Starter, Hand, 9/32" X 5 1/3" long, Type III |
| 5120006184909 | 239. | 4.0 | 1.7 | Screwdriver, Clutch Tip, 1/4" x 5" long |
| 5120006184907 | 79. | 10.8 | 13.7 | Screwdriver, Clutch Tip, 1/8" x 3" long |
| 5120006184908 | 79. | 8.0 | 10.1 | Screwdriver, Clutch Tip, 3/16" x 4" long |
| 5120009263628 | 128. | 4.0 | 3.1 | Screwdriver, Clutch Tip, 3/32" x 3" long |
| 5120006184911 | 149. | 7.0 | 4.7 | Screwdriver, Clutch Tip, 5/16" x 6" long |
| 5120005134910 | 215. | 6.0 | 2.8 | Screwdriver, Clutch Tip, 9/32" x 6" long |
| 5120002247370 | 498. | 26.4 | 5.3 | Screwdriver, Cross Tip, No. 1, 1" long |
| 5120002930314 | 421. | 48.0 | 11.4 | Screwdriver, Flat Tip, 1/4" x 10" long |
| 5120005968553 | 401. | 86.2 | 21.5 | Screwdriver, Flat Tip, 1/4" x 6" long |
| 5120002277356 | 407. | 94.4 | 23.2 | Screwdriver, Flat Tip, 3/16" x 6" long |
| 5120002277362 | 513. | 74.8 | 14.6 | Screwdriver, Flat Tip, 3/8" x 12" long, Straight sided |
| 5120002455232 | 648. | 15.8 | 2.4 | Screwdriver, Flat Tip, 3/8" x 6" long, offset |
| 5120002277334 | 519. | 62.6 | 12.1 | Screwdriver, Flat Tip, 7/32" x 10" long |
| 5120002348313 | 616. | 85.4 | 13.9 | Screwdriver, Phillips no 2, 4" long |
| 5120002247375 | 659. | 77.4 | 11.7 | Screwdriver, Phillips no 4, 8" long |
| 5120002348312 | 709. | 83.0 | 11.7 | Screwdriver, Phillips no. 3, 6" long |
| 5120002277293 | 513. | 16.0 | 3.1 | Screwdriver, Phillips No. 2, 1 1/2" long |
| 5120002378173 | 135. | 23.2 | 17.2 | Screwdriver, R & P Cross Tip, 1/4" x 4" long |
| 5120002378174 | 144. | 4.8 | 3.3 | Screwdriver, R & P Cross Tip, 3/8" x 8" long |
| 5120002378172 | 257. | 6.0 | 2.3 | Screwdriver, R & P, 5/16" x 6" long |
| 5110002039542 | 41. | 0.0 | 0.0 | Shears, Bent Trimmers, 12" long |
| 5110002730128 | 473. | 9.2 | 1.9 | Shears, Metal Cut, Hand, Straight, 10" long |
| 5120002437341 | 524. | 14.6 | 2.8 | Socket, Deep Style, 1/2" sq dr, 1 1/16", 12 point |
| 5120002437339 | 465. | 0.0 | 0.0 | Socket, Deep Style, 1/2" sq dr, 1 1/8", 12 point |
| 5120002437351 | 611. | 20.6 | 3.4 | Socket, Deep Style, 1/2" sq dr, 1/2", 12 point |
| 5120002437340 | 627. | 9.4 | 1.5 | Socket, Deep Style, 1/2" sq dr, 1", 12 point |
| 5120002437346 | 609. | 13.2 | 2.2 | Socket, Deep Style, 1/2" sq dr, 11/16", 12 point |
| 5120002437345 | 648. | 26.8 | 4.1 | Socket, Deep Style, 1/2" sq dr, 13/16", 12 point |
| 5120002437343 | 637. | 9.2 | 1.4 | Socket, Deep Style, 1/2" sq dr, 15/16", 12 point |
| 5120002423349 | 670. | 17.3 | 2.7 | Socket, Deep Style, 1/2" sq dr, 3/4", 12 point |
| 5120002355393 | 618. | 20.2 | 3.3 | Socket, Deep Style, 1/2" sq dr, 5/8", 12 point |
| 5120002437350 | 569. | 6.4 | 1.1 | Socket, Deep Style, 1/2" sq dr, 7/16", 12 point |
| 5120002437342 | 646. | 29.2 | 4.5 | Socket, Deep Style, 1/2" sq dr, 7/8", 12 point |
| 5120002437348 | 619. | 16.4 | 2.6 | Socket, Deep Style, 1/2" sq dr, 9/16", 12 point |
| 5120002413185 | 652. | 29.0 | 4.4 | Socket, Deep Style, 3/8" sq dr, 1/2", 12 point |
| 5120002774252 | 664. | 0.0 | 0.0 | Socket, Deep Style, 3/8" sq dr, 11/16", 12 point |
| 5120002355879 | 669. | 20.2 | 3.0 | Socket, Deep Style, 3/8" sq dr, 3/4", 12 point |
| 5120002771453 | 652. | 29.8 | 4.6 | Socket, Deep Style, 3/8" sq dr, 3/8", 12 point |
| 5120002390018 | 575. | 9.0 | 1.6 | Socket, Deep Style, 3/8" sq dr, 5/8", 12 point |

| Stock Number | Number Authorized | Predicted Ann. Rtns. | Annual Inv. Consumed (%) | Nomenclature |
|---|---|---|---|---|
| 5120002771444 | 640. | 20.8 | 3.2 | Socket, Deep Style, 3/8" sq dr, 7/16", 12 point |
| 5120002390317 | 637. | 26.9 | 4.2 | Socket, Deep Style, 3/8" sq dr, 9/16", 12 point |
| 5130002218006 | 237. | 0.0 | 0.0 | Socket, Impact, 1/2" sq dr, 1/2", 6 point |
| 5130002218011 | 239. | 0.0 | 0.0 | Socket, Impact, 1/2" sq dr, 13/16", 6 point |
| 5130002276594 | 239. | 3.0 | 1.3 | Socket, Impact, 1/2" sq dr, 7/8", 6 point |
| 5130002218009 | 107. | 0.0 | 0.0 | Socket, Impact, 1/2" sq dr, 11/16", 6 point |
| 5130002218007 | 96. | 2.4 | 2.5 | Socket, Impact, 1/2" sq dr, 9/16", 6 point |
| 5130002218010 | 107. | 0.0 | 0.0 | Socket, Impact, 1/2" sq dr, 3/4", 6 point |
| 5130002219008 | 107. | 2.0 | 1.9 | Socket, Impact, 1/2" sq dr, 5/8", 6 point |
| 5120001877913 | 602. | 16.4 | 2.7 | Socket, Regular Depth, 1/2" sq dr, 1 1/16", 12 point |
| 5120001877914 | 656. | 13.2 | 2.0 | Socket, Regular Depth, 1/2" sq dr, 1 1/8", 12 point |
| 5120002370984 | 696. | 25.6 | 3.7 | Socket, Regular Depth, 1/2" sq dr, 1/2", 12 point |
| 5120001877927 | 651. | 11.2 | 1.7 | Socket, Regular Depth, 1/2" sq dr, 1", 12 point |
| 5120002365376 | 681. | 25.2 | 3.7 | Socket, Regular Depth, 1/2" sq dr, 11/16", 12 point |
| 5120001877933 | 692. | 21.0 | 3.1 | Socket, Regular Depth, 1/2" sq dr, 13/16", 12 point |
| 5120001877935 | 645. | 5.0 | 0.8 | Socket, Regular Depth, 1/2" sq dr, 15/16", 12 point |
| 5120001877985 | 661. | 41.0 | 6.2 | Socket, Regular Depth, 1/2" sq dr, 3/4", 12 point |
| 5120002370982 | 652. | 20.4 | 3.1 | Socket, Regular Depth, 1/2" sq dr, 7/8", 12 point |
| 5120001877946 | 659. | 15.0 | 2.4 | Socket, Regular Depth, 1/2" sq dr, 5/8", 12 point |
| 5120001877924 | 682. | 18.8 | 2.8 | Socket, Regular Depth, 1/2" sq dr, 7/16", 12 point |
| 5120001877934 | 682. | 6.0 | 0.9 | Socket, Regular Depth, 1/2" sq dr, 7/8", 12 point |
| 5120001877932 | 672. | 39.6 | 5.9 | Socket, Regular Depth, 1/2" sq dr, 9/16", 12 point |
| 5120002370977 | 673. | 39.8 | 5.9 | Socket, Regular Depth, 3/8" sq dr, 1/2", 12 point |
| 5120002325706 | 679. | 12.6 | 1.9 | Socket, Regular Depth, 3/8" sq dr, 11/16", 12 point |
| 5120002276705 | 690. | 17.9 | 2.6 | Socket, Regular Depth, 3/8" sq dr, 3/4", 12 point |
| 5120002276702 | 658. | 49.0 | 7.3 | Socket, Regular Depth, 3/8" sq dr, 3/8", 12 point |
| 5120002325711 | 560. | 22.8 | 4.1 | Socket, Regular Depth, 3/8" sq dr, 5/16", 12 point |
| 5120002374973 | 694. | 7.2 | 1.0 | Socket, Regular Depth, 3/8" sq dr, 5/8", 12 point |
| 5120002276703 | 666. | 23.4 | 3.5 | Socket, Regular Depth, 3/8" sq dr, 7/16", 12 point |
| 5120002276704 | 638. | 31.0 | 4.9 | Socket, Regular Depth, 3/8" sq dr, 9/16", 12 point |
| 5120006762431 | 527. | 4.0 | 0.8 | Socket, Spark Plug, 3/8" sq dr, 13/16", 12 point |
| 5120001873754 | 358. | 2.0 | 0.6 | Socket, 14 MM Spark Plug, 3/8" sq dr, 5/8", 12 point |
| 5120002423365 | 619. | 26.0 | 4.2 | Socket, Wr, Univ, 3/8" sq dr, 1/2", 12 point |
| 5120002730979 | 622. | 20.4 | 3.3 | Socket, Wr, Univ, 3/8" sq dr, 11/16", 12 point |
| 5120002370980 | 610. | 12.8 | 2.1 | Socket, Wr, Univ, 3/8" sq dr, 3/4", 12 point |
| 5120002355372 | 612. | 7.2 | 1.2 | Socket, Wr, Univ, 3/8" sq dr, 3/8", 12 point |
| 5120002374974 | 613. | 14.2 | 2.3 | Socket, Wr, Univ, 3/8" sq dr, 5/8", 12 point |
| 5120002423354 | 627. | 12.0 | 1.9 | Socket, Wr, Univ, 3/8" sq dr, 7/16", 12 point |
| 5120002370978 | 616. | 19.4 | 3.1 | Socket, Wr, Univ, 3/8" sq dr, 9/16", 12 point |
| 5120002874150 | 41. | 0.0 | 0.0 | Socket, 1/2" sq dr, 10 MM, 12 point, STD |
| 5120002634136 | 36. | 0.0 | 0.0 | Socket, 1/2" sq dr, 11 MM, 12 point, STD |
| 5120002874151 | 38. | 0.0 | 0.0 | Socket, 1/2" sq dr, 12 MM, 12 point, STD |
| 5120002634137 | 41. | 0.0 | 0.0 | Socket, 1/2" sq dr, 13 MM, 12 point, STD |
| 5120010288541 | 23. | 0.0 | 0.0 | Socket, 1/2" sq dr, 14 MM, 12 point, Deep |
| 5120002634135 | 41. | 0.0 | 0.0 | Socket, 1/2" sq dr, 14 MM, 12 point, STD |
| 5120002634149 | 39. | 0.0 | 0.0 | Socket, 1/2" sq dr, 15 MM, 12 point, STD |
| 5120002634148 | 38. | 0.0 | 0.0 | Socket, 1/2" sq dr, 16 MM, 12 point, STD |

| Stock Number | Number Authorized | Predicted Ann. Ftrs. | Annual Inv. Consumed (%) | Nomenclature |
|---|---|---|---|---|
| 5120C102c4590 | 41. | 0.0 | 0.0 | Socket, 1/2" sq dr, 17 MM, 12 point, Deep |
| 5120010259367 | 20. | 0.0 | 0.0 | Socket, 1/2" sq dr, 17 MM, 12 point, Deep |
| 5120002634143 | 41. | 0.0 | 0.0 | Socket, 1/2" sq dr, 17 MM, 12 point, STD |
| 5120002634142 | 27. | 0.0 | 0.0 | Socket, 1/2" sq dr, 18 MM, 12 point, STD |
| 5120010467300 | 53. | 0.0 | 0.0 | Socket, 1/2" sq dr, 19 MM, 12 point, Deep |
| 5120001401428 | 38. | 0.0 | 0.0 | Socket, 1/2" sq dr, 19 MM, 12 point, STD |
| 5120010457301 | 39. | 0.0 | 0.0 | Socket, 1/2" sq dr, 20 MM, 12 point, Deep |
| 5120002634141 | 54. | 0.0 | 0.0 | Socket, 1/2" sq dr, 20 MM, 12 point, STD |
| 5120002634140 | 57. | 0.0 | 0.0 | Socket, 1/2" sq dr, 21 MM, 12 point, STD |
| 5120010248540 | 41. | 0.0 | 0.0 | Socket, 1/2" sq dr, 22 MM, 12 point, Deep |
| 5120002634139 | 57. | 0.0 | 0.0 | Socket, 1/2" sq dr, 22 MM, 12 point, STD |
| 5120002974152 | 44. | 0.0 | 0.0 | Socket, 1/2" sq dr, 23 MM, 12 point, STD |
| 5120002974151 | 57. | 0.0 | 0.0 | Socket, 1/2" sq dr, 24 MM, 12 point, STD |
| 5120002874154 | 57. | 0.0 | 0.0 | Socket, 1/2" sq dr, 25 MM, 12 point, STD |
| 5120002874153 | 35. | 0.0 | 0.0 | Socket, 1/2" sq dr, 26 MM, 12 point, STD |
| 5120002634147 | 37. | 0.0 | 0.0 | Socket, 1/2" sq dr, 27 MM, 12 point, STD |
| 5120002634144 | 38. | 0.0 | 0.0 | Socket, 1/2" sq dr, 28 MM, 12 point, STD |
| 5120002634146 | 36. | 0.0 | 0.0 | Socket, 1/2" sq dr, 29 MM, 12 point, STD |
| 5120002634145 | 35. | 0.0 | 0.0 | Socket, 1/2" sq dr, 30 MM, 12 point, STD |
| 5120010250198 | 32. | 0.0 | 0.0 | Socket, 1/2" sq dr, 31 MM, 12 point, STD |
| 5120010250197 | 38. | 0.0 | 0.0 | Socket, 1/2" sq dr, 32 MM, 12 point, STD |
| 5120010454JH4 | 101. | 0.0 | 0.0 | Socket, 1/4" sq dr, 5 MM, 12 point, STD |
| 5120010454585 | 112. | 0.0 | 0.0 | Socket, 1/4" sq dr, 6 MM, 12 point, STD |
| 5120010454938 | 112. | 0.0 | 0.0 | Socket, 1/4" sq dr, 7 MM, 12 point, STD |
| 5120010310702 | 112. | 0.0 | 0.0 | Socket, 1/4" sq dr, 8 MM, 12 point, STD |
| 5120010264589 | 102. | 0.0 | 0.0 | Socket, 1/4" sq dr, 9 MM, 12 point, STD |
| 5120010141H33 | 99. | 0.0 | 0.0 | Socket, 1/4" sq dr, 10 MM, 12 point, STD |
| 5120010264588 | 100. | 0.0 | 0.0 | Socket, 1/4" sq dr, 11 MM, 12 point, STD |
| 5120010264587 | 101. | 0.0 | 0.0 | Socket, 1/4" sq dr, 12 MM, 12 point, STD |
| 5120010288539 | 106. | 0.0 | 0.0 | Socket, 1/4" sq dr, 13 MM, 12 point, STD |
| 5120010246096 | 99. | 0.0 | 0.0 | Socket, 1/4" sq dr, 14 MM, 12 point, STD |
| 5120010246152 | 210. | 0.0 | 0.0 | Socket, 3/8" sq dr, 8 MM, 12 point, STD |
| 5120010454374 | 206. | 0.0 | 0.0 | Socket, 3/8" sq dr, 9 MM, 12 point, Deep |
| 5120010246151 | 223. | 0.0 | 0.0 | Socket, 3/8" sq dr, 9 MM, 12 point, STD |
| 5120010454175 | 164. | 0.0 | 0.0 | Socket, 3/8" sq dr, 10 MM, 12 point, Deep |
| 5120010246150 | 227. | 0.0 | 0.0 | Socket, 3/8" sq dr, 10 MM, 12 point, STD |
| 5120010499582 | 87. | 0.0 | 0.0 | Socket, 3/8" sq dr, 10 MM, 12 point, Univ |
| 5120010454177 | 146. | 0.0 | 0.0 | Socket, 3/8" sq dr, 11 MM, 12 point, Deep |
| 5120010246149 | 228. | 0.0 | 0.0 | Socket, 3/8" sq dr, 11 MM, 12 point, STD |
| 5120010454176 | 140. | 0.0 | 0.0 | Socket, 3/8" sq dr, 12 MM, 12 point, Deep |
| 5120010246148 | 229. | 0.0 | 0.0 | Socket, 3/8" sq dr, 12 MM, 12 point, STD |
| 5120010499585 | 87. | 0.0 | 0.0 | Socket, 3/8" sq dr, 12 MM, 12 point, Univ |
| 5120010324923 | 142. | 0.0 | 0.0 | Socket, 3/8" sq dr, 13 MM, 12 point, Deep |
| 5120010246147 | 225. | 0.0 | 0.0 | Socket, 3/8" sq dr, 13 MM, 12 point, STD |
| 5120010499583 | 87. | 0.0 | 0.0 | Socket, 3/8" sq dr, 13 MM, 12 point, Univ |
| 5120010454876 | 142. | 0.0 | 0.0 | Socket, 3/8" sq dr, 14 MM, 12 point, Deep |
| 5120010246146 | 224. | 0.0 | 0.0 | Socket, 3/8" sq dr, 14 MM, 12 point, STD |

| Stock Number | Number Authorized | Predicted Ann. Firs. | Annual Inv. Consumed ($) | Nomenclature |
|---|---|---|---|---|
| 5120010459584 | 112. | 0.0 | 0.0 | Socket, 3/8" sq dr, 14 MM, 12 point, Univ |
| 5120010454479 | 132. | 0.0 | 0.0 | Socket, 3/8" sq dr, 15 MM, 12 point, Deep |
| 5120010246145 | 223. | 0.0 | 0.0 | Socket, 3/8" sq dr, 15 MM, 12 point, STD |
| 5120010464733 | 101. | 0.0 | 0.0 | Socket, 3/8" sq dr, 15 MM, 12 point, Univ |
| 5120010454480 | 120. | 0.0 | 0.0 | Socket, 3/8" sq dr, 16 MM, 12 point, Deep |
| 5120010430776 | 220. | 0.0 | 0.0 | Socket, 3/8" sq dr, 16 MM, 12 point, STD |
| 5120010464734 | 104. | 0.0 | 0.0 | Socket, 3/8" sq dr, 16 MM, 12 point, Univ |
| 5120010454481 | 116. | 0.0 | 0.0 | Socket, 3/8" sq dr, 17 MM, 12 point, Deep |
| 5120010246144 | 226. | 0.0 | 0.0 | Socket, 3/8" sq dr, 17 MM, 12 point, STD |
| 5120010464735 | 104. | 0.0 | 0.0 | Socket, 3/8" sq dr, 17 MM, 12 point, Univ |
| 5120010454482 | 126. | 0.0 | 0.0 | Socket, 3/8" sq dr, 18 MM, 12 point, Deep |
| 5120010458564 | 222. | 0.0 | 0.0 | Socket, 3/8" sq dr, 18 MM, 12 point, STD |
| 5120010464936 | 103. | 0.0 | 0.0 | Socket, 3/8" sq dr, 18 MM, 12 point, Univ |
| 5120010454483 | 119. | 0.0 | 0.0 | Socket, 3/8" sq dr, 19 MM, 12 point, Deep |
| 5120010458565 | 214. | 0.0 | 0.0 | Socket, 3/8" sq dr, 19 MM, 12 point, STD |
| 5120010464937 | 19. | 0.0 | 0.0 | Socket, 3/8" sq dr, 19 MM, 12 point, Univ |
| 5120010458566 | 207. | 0.0 | 0.0 | Socket, 3/8" sq dr, 20 MM, 12 point, STD |
| 5120010458567 | 203. | 0.0 | 0.0 | Socket, 3/8" sq dr, 21 MM, 12 point, STD |
| 5120010458568 | 203. | 0.0 | 0.0 | Socket, 3/8" sq dr, 22 MM, 12 point, STD |
| 5120010458570 | 199. | 0.0 | 0.0 | Socket, 3/8" sq dr, 25 MM, 12 point, STD |
| 5120005961034 | 538. | 10.2 | 1.9 | Tool, Brake Adjusting |
| 5120001856761 | 154. | 2.4 | 1.6 | Tool, Distributor Point Adjustment, (Delco-Remy) Flexible |
| 5120005454768 | 465. | 2.4 | 0.5 | Tool, Retrieving, Magnetic, 15 1/4" - 18" lg GGG-F-00300 |
| 5120002697971 | 560. | 26.0 | 4.6 | Universal Joint, Socket Wrench, 1/2" sq dr, End |
| 5120002249215 | 550. | 21.6 | 4.0 | Universal Joint, Socket Wrench, 3/8" sq dr, End |
| 5120004650604 | 204. | 11.2 | 5.5 | Wrench Pliers, Curved Jaw/Cutter, 5 1/2" long |
| 5120004941711 | 352. | 15.6 | 4.4 | Wrench Pliers, Curved Jaw/Cutter, 8 1/2" long |
| 5120002779076 | 10. | 0.0 | 0.0 | Wrench Spanner, 2"-4 3/4", Circle Diameter |
| 5120010454900 | 200. | 0.0 | 0.0 | Wrench, Box/OE, 6 MM |
| 5120010454901 | 210. | 0.0 | 0.0 | Wrench, Box/OE, 7 MM |
| 5120010454902 | 204. | 0.0 | 0.0 | Wrench, Box/OE, 8 MM |
| 5120010454903 | 204. | 3.0 | 1.5 | Wrench, Box/OE, 9 MM |
| 5120010454904 | 242. | 3.0 | 1.2 | Wrench, Box/OE, 10 MM |
| 5120010454905 | 243. | 3.0 | 1.2 | Wrench, Box/OE, 11 MM |
| 5120010454906 | 241. | 3.0 | 1.2 | Wrench, Box/OE, 12 MM |
| 5120010464951 | 242. | 6.0 | 2.5 | Wrench, Box/OE, 13 MM |
| 5120010454907 | 247. | 6.0 | 2.4 | Wrench, Box/OE, 14 MM |
| 5120010454912 | 244. | 6.0 | 2.5 | Wrench, Box/OE, 15 MM |
| 5120010454908 | 242. | 0.0 | 0.0 | Wrench, Box/OE, 16 MM |
| 5120010454909 | 236. | 3.0 | 1.3 | Wrench, Box/OE, 17 MM |
| 5120010454910 | 238. | 0.0 | 0.0 | Wrench, Box/OE, 18 MM |
| 5120010454911 | 225. | 4.0 | 1.8 | Wrench, Box/OE, 19 MM |
| 5120002289521 | 298. | 5.4 | 1.9 | Wrench, Box, 1 1/16" x 1 1/8", 12 point, 15 degree offset |
| 5120001848677 | 171. | 0.0 | 0.0 | Wrench, Box, 1 1/4" x 1 3/8", 12 point, 15 degree offset |
| 5120001848676 | 226. | 2.4 | 1.1 | Wrench, Box, 1 1/4" x 1 5/16", 12 point, 15 degree offset |
| 5120002771582 | 119. | 0.0 | 0.0 | Wrench, Box, 1 7/16" x 1 1/2", 12 point, Double offset |
| 5120001849671 | 231. | 0.0 | 0.0 | Wrench, Box, 1 7/16" x 1 1/2", 12 point, 15 degree offset |

| Stock Number | Number Authorized | Predicted Ann. Firs. | Annual Inv. Consumed (%) | Nomenclature |
|---|---|---|---|---|
| 5120002773364 | 414. | 6.0 | 1.4 | Wrench, Box, 1/2" & 9/16" angular offset |
| 5120002242154 | 444. | 4.0 | 0.9 | Wrench, Box, 1/2" & 9/16" dbl offset, dbl head, 6" long |
| 5120002772692 | 359. | 2.4 | 0.7 | Wrench, Box, 11/16" & 3/4" half-moon, 7 3/4" long |
| 5120002771436 | 451. | 2.4 | 0.5 | Wrench, Box, 11/16" & 3/4" Offset 11 3/4" long |
| 5120002221593 | 435. | 16.8 | 3.9 | Wrench, Box, 13/16" & 7/8" angular offset, dbl hd, 14" lg |
| 5120002042570 | 335. | 5.0 | 1.5 | Wrench, Box, 15/16" & 1" offset |
| 5120002042550 | 185. | 0.0 | 0.0 | Wrench, Box, 3/16" & 1/4" angular offset, dbl hd, 2 3/4" |
| 5120002243145 | 499. | 4.4 | 0.9 | Wrench, Box, 3/8" & 7/16" angular offset, dbl hd, 5/16" lg |
| 5120001948602 | 373. | 0.0 | 0.0 | Wrench, Box, 5/16" & 3/8" angular offset, dbl hd, 5" long |
| 5120002771437 | 212. | 4.0 | 1.9 | Wrench, Box, 5/8" & 3/4" Double Head |
| 5120005968556 | 279. | 0.0 | 0.0 | Wrench, Box, 7/16" & 1/2" angular offset |
| 5120002771598 | 273. | 4.8 | 1.8 | Wrench, Box, 7/8" & 15/16" Double Head |
| 5120002243143 | 353. | 2.0 | 0.6 | Wrench, Box, 9/16" & 5/8" angular offset, dbl hd, 9 5/8" lg |
| 5120002221595 | 546. | 14.6 | 2.7 | Wrench, Box, 9/16" & 5/8" Half-Moon |
| 5120002239511 | 585. | 0.0 | 0.0 | Wrench, Comb Box/OE 13/16"Box, 13/16"OE, Offset, 10 1/4" lg |
| 5120002239510 | 593. | 7.3 | 1.3 | Wrench, Comb Box/OE 3/4" Box, 3/4" OE, Offset, 8" long |
| 5120002259504 | 595. | 14.6 | 2.5 | Wrench, Comb Box/OE 3/8" Box, 3/8" OE, 4 3/16" long |
| 5120002249503 | 606. | 18.0 | 3.0 | Wrench, Comb Box/OE 5/16"Box,5/16"OE, Como offset, 3 1/4" lg |
| 5120002239505 | 606. | 10.4 | 1.7 | Wrench, Comb Box/OE 7/16" Box, 7/16" OE, 5" long |
| 5120002269515 | 301. | 4.8 | 1.6 | Wrench, Comb Box/OE, 1 1/16", 15deg offset, 14" lg, Type III |
| 5120002778834 | 212. | 2.4 | 1.1 | Wrench, Comb Box/OE, 1 1/2", 15 degree offset, 19" long |
| 5120002269517 | 307. | 2.0 | 0.7 | Wrench, Comb Box/OE, 1 1/4", 15 deg offset, 15" lg, Type III |
| 5120002239516 | 392. | 2.0 | 0.5 | Wrench, Comb Box/OE, 1 1/8", 15 deg offset,14 1/2"lg,TypeIII |
| 5120002034501 | 14. | 0.0 | 0.0 | Wrench, Comb Box/OE, 1 3/4", Packing Nut |
| 5120002778333 | 174. | 0.0 | 0.0 | Wrench, Comb Box/OE, 1 3/8", 15 degree offset |
| 5120002259518 | 238. | 0.0 | 0.0 | Wrench, Comb Box/OE, 1 5/16", 15 degree offset |
| 5120002249519 | 174. | 0.0 | 0.0 | Wrench, Comb Box/OE, 1 7/16", 15 deg offset, 18" lg |
| 5120002269506 | 594. | 6.6 | 1.1 | Wrench, Comb Box/OE, 1/2" Box, 1/2" OE, Offset, 5 1/4 long |
| 5120002259514 | 550. | 19.8 | 3.5 | Wrench, Comb Box/OE, 1" Box, 1" OE, Offset, 12 1/2" long |
| 5120002269509 | 624. | 8.8 | 1.4 | Wrench, Comb Box/OE, 11/16 Box, 11/16 OE, Offset, 7" long |
| 5120002259513 | 612. | 4.8 | 0.8 | Wrench, Comb Box/OE, 15/16" Box, 15/16" OE, 12" long |
| 5120002269503 | 599. | 12.2 | 2.0 | Wrench, Comb Box/OE, 5/8" Box, 5/8" OE, Offset, 6 1/8" long |
| 5120002269507 | 592. | 11.5 | 2.0 | Wrench, Comb Box/OE, 9/16" Box, 9/16" OE, 5 3/4" long |
| 5120010250207 | 83. | 0.0 | 0.0 | Wrench, Flare Nut, 10 & 12 MM, 6 point |
| 5120009357366 | 50. | 0.0 | 0.0 | Wrench, Flare Nut, 12 point, 1/2" X 9/16" |
| 5120009357365 | 61. | 0.0 | 0.0 | Wrench, Flare Nut, 12 point, 3/8" x 7/16" |
| 5120009357367 | 36. | 0.0 | 0.0 | Wrench, Flare Nut, 12 point, 5/8" x 11/16" |
| 5120010250206 | 87. | 0.0 | 0.0 | Wrench, Flare Nut, 9 & 11 MM, 5 point |
| 5130009892134 | 216. | 6.0 | 2.8 | Wrench, Impact, PNU, 1/2" sq dr. |
| 5130001841427 | 38. | 3.0 | 7.9 | Wrench, Impact, PNU, 3/4" sq dr |
| 5130005177024 | 294. | 9.6 | 3.3 | Wrench, Impact, PNU, 3/8" sq dr |
| 5130001877134 | 113. | 0.0 | 0.0 | Wrench, OE, 1 1/16" x 1 1/4", 15 deg offset, 11 3/4" lg |
| 5120002249527 | 130. | 2.0 | 1.5 | Wrench, OE, 3/16" & 1/4" Fixed, Double Head, 3" long |
| 5120002405430 | 505. | 24.4 | 4.8 | Wrench, OE, Adj 0 to 0.510", 4" long |
| 5120002405428 | 639. | 34.0 | 5.3 | Wrench, OE, Adj 0 to 0.947, 8" long |
| 5120004498093 | 614. | 11.0 | 1.9 | Wrench, OE, Adj 0 to 1.135", 10" long |
| 5120002643790 | 565. | 47.4 | 8.4 | Wrench, OE, Adj 0 to 1.322 12" long |

| Stock Number | Number Authorized | Predicted Ann. Ptrs. | Annual Inv. Consumed (%) | Nomenclature |
|---|---|---|---|---|
| 5136002543793 | 59. | 2.0 | 3.4 | Wrench, OE, Adj, 14 1/2"-15 1/2", Size 15, GGG-W-631 |
| 5120001877124 | 412. | 10.4 | 2.5 | Wrench, OE, 1/2" & 9/16" Fixed Dble Hd 5 3/8" long |
| 5120001948445 | 191. | 0.0 | 0.0 | Wrench, OE, 1/4" offset, Double Head, 3" long |
| 5120001848444 | 193. | 4.0 | 2.0 | Wrench, OE, 11/32" offset, Double Head, 4 1/2" long |
| 5120001877123 | 511. | 4.4 | 0.9 | Wrench, OE, 3/4" & 15/16", 8" long |
| 5120002772342 | 555. | 6.0 | 1.1 | Wrench, OE, 3/8" & 7/16" |
| 5120002772307 | 384. | 2.0 | 0.5 | Wrench, OE, 5/16" & 3/8", 3 5/8" long |
| 5120001948447 | 199. | 0.0 | 0.0 | Wrench, OE, 5/16" offset, Double Head 3 1/2" long |
| 5120001877121 | 489. | 2.0 | 0.4 | Wrench, OE, 7/16" & 1/2" Fixed, Double Head, 5" long |
| 5120001477131 | 476. | 5.4 | 1.4 | Wrench, OE, 7/8" & 15/16", 9" long |
| 5120001877125 | 518. | 6.8 | 1.3 | Wrench, OE, 9/16" & 5/8" Fixed, Double Head, 6" long |
| 5136001848563 | 31. | 4.8 | 15.5 | Wrench, OE,Thinl 5/16" x 1 3/8", 3/16" offset at 15 deg ang |
| 5136001848564 | 31. | 0.0 | 0.0 | Wrench, OE,Thinl 7/16" x 1 1/2", 3/16" offset at 15 deg ang |
| 5120002771486 | 516. | 19.4 | 3.8 | Wrench, Pipe, Adjustable, 1/2" - 1 1/2", 14" long |
| 5120002771484 | 553. | 14.0 | 2.5 | Wrench, Pipe, Adjustable, 1/4" - 3/4", 8" long |
| 5120005850331 | 254. | 32.0 | 12.6 | Wrench, Telescoping P/N 401 |
| 5120005850332 | 254. | 21.6 | 8.5 | Wrench, Telescoping P/N 402 |
| 5120006426365 | 43. | 2.0 | 4.7 | Wrench, Torque, 1/2" sq dr, 0-250 ft lbs |
| 5120002217983 | 17. | 0.0 | 0.0 | Wrench, Torque, 3/4" sq dr, 0-500 ft lbs |
| Totals | 101196. | 3380.2 | 3.3 | |

Group of Tools Selected:
SCREWDRIVERS

TTP Nos. 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75

| Stock Number | Number Authorized | Predicted Ann. Firs. | Annual Inv. Consumed (%) | Nomenclature |
|---|---|---|---|---|
| 5120006184909 | 239. | 4.0 | 1.7 | Screwdriver, Clutch Tip, 1/4" x 5" long |
| 5120006184907 | 79. | 10.8 | 13.7 | Screwdriver, Clutch Tip, 1/8" x 3" long |
| 5120006184908 | 79. | 8.0 | 10.1 | Screwdriver, Clutch Tip, 3/16" x 4" long |
| 5120009263528 | 128. | 4.0 | 3.1 | Screwdriver, Clutch Tip, 3/32" x 3" long |
| 5120006184911 | 149. | 7.0 | 4.7 | Screwdriver, Clutch Tip, 5/16" x 6" long |
| 5120006184910 | 215. | 6.0 | 2.8 | Screwdriver, Clutch Tip, 9/32" x 6" long |
| 5120002247370 | 498. | 26.4 | 5.3 | Screwdriver, Cross Tip, No. 1, 1" long |
| 5120002930314 | 421. | 48.0 | 11.4 | Screwdriver, Flat Tip, 1/4" x 10" long |
| 5120005968653 | 401. | 86.2 | 21.5 | Screwdriver, Flat Tip, 1/4" x 6" long |
| 5120002277356 | 407. | 94.4 | 23.2 | Screwdriver, Flat Tip, 3/16" x 6" long |
| 5120002277362 | 513. | 74.8 | 14.6 | Screwdriver, Flat Tip, 3/8" x 12" long, Straight sided |
| 5120002405232 | 649. | 15.8 | 2.4 | Screwdriver, Flat Tip, 3/8" x 6" long, offset |
| 5120002277334 | 519. | 62.6 | 12.1 | Screwdriver, Flat Tip, 7/32" x 10" long |
| 5120002348913 | 616. | 85.4 | 13.9 | Screwdriver, Phillips no 2, 4" long |
| 5120002247375 | 659. | 77.4 | 11.7 | Screwdriver, Phillips no 4, 8" long |
| 5120002348912 | 709. | 83.0 | 11.7 | Screwdriver, Phillips no. 3, 6" long |
| 5120002277293 | 513. | 16.0 | 3.1 | Screwdriver, Phillips No. 2, 1 1/2" long |
| 5120002378173 | 135. | 23.2 | 17.2 | Screwdriver, R & P Cross Tip, 1/4" x 4" long |
| 5120002378174 | 144. | 4.8 | 3.3 | Screwdriver, R & P Cross Tip, 3/8" x 9" long |
| 5120002378172 | 257. | 6.0 | 2.3 | Screwdriver, R & P, 5/16" x 6" long |
| Totals | 7328. | 743.8 | 10.2 | |



TABLE 3

| Stock Number | Number Authorized | Predicted Ann. Firs. | Annual Inv. Consumed (%) | Nomenclature |
|---|---|---|---|---|
| 5120002306385 | 675. | 80.4 | 11.9 | Handle, Socket Wrench, 1/2" drive x 9" long, Ratchet |
| 5120000654903 | 395. | 39.2 | 9.9 | Handle, Socket Wrench, 3/8" drive, 10 1/4" long, Ratchet |
| 5120002465364 | 554. | 123.8 | 18.9 | Handle, Socket Wrench, 3/8" drive, 6" long, Ratchet |
| 5120002437322 | 295. | 8.8 | 3.0 | Ratchet Attachment, Socket Wrench, Rev., 1/2" sq dr |
| 5120002271207 | 121. | 0.0 | 0.0 | Ratchet Attachment, Socket Wrench, Rev., 1/4" sq dr |
| 5120002279127 | 243. | 9.2 | 3.8 | Ratchet Attachment, Socket Wrench, Rev., 3/8" sq dr |
| Totals | 2390. | 261.4 | 11.0 | |



TABLE 4

## BIBLIOGRAPHY


1. General Services Administration. GSA Supply Catalog: Change Bulletin, Washington, Government Printing Office, July 1982.

2. Hauck, Raymond J. Capt, USAF. Herndon, Charles W. Magt, USAF. Feasibility Study of Lifetime Warranted Handtools in Air Force Maintenance Activities (Final Report). Gunter AFS, Al., Air Force Logistics Management Center Project 780205, January 1980.

3. Hauck, R. J., Capt, USAF. Warranted Tool Program Implementation Evaluation Plan, 1 March 1982. Air Force Logistics Management Center Project No. 780205. Gunter AFS, Al.

4. Linhardt, Robert L., Major, USAF. A Study of Handtool Control Procedures, February 1977. Air Command and Staff College paper, Air University, Maxwell AFB, Al.

5. T.O. 36-1-50. Motor Vehicle Maintenance Tool Kits by AFSC, Tool Kit Items.

6. Wheeler, Travis M., Capt; Miller, Charles E., GS-12. Warranted Tool Program Field Evaluation Report, June 1982. Air Force Logistics Management Center Project No. 780205. Gunter AFS, Al.

## ABBREVIATIONS

AAC - ALASKAN AIR COMMAND

AFLMC - AIR FORCE LOGISTICS MANAGEMENT CENTER

GSA - GENERAL SERVICES ADMINISTRATION

LMC - LOGISTICS MANAGEMENT CENTER

MAC - MILITARY AIRLIFT COMMAND

MAJCOM - MAJOR AIR COMMAND

PACAF - PACIFIC AIR FORCES

SAC - STRATEGIC AIR COMMAND

TAC - TACTICAL AIR COMMAND

USAFE - UNITED STATES AIR FORCES EUROPE

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON, D.C. 20330

22 FEB 1984

REPLY TO ATTN OF: LETN

SUBJECT: Warranted Tools

TO: AFLMC/LGT

1. Request your activity initiate a project to determine the feasibility and cost effectiveness of using warranted hand tools in vehicle maintenance activities. The project, similar to the aircraft maintenance project, should include the following:

a. Determine what quality problems we are currently having with hand tools.
b. What changes are needed, if any, in our current tool control procedures in AFM 77-310, Vol 2?
c. Determine the minimum essential tools that need to be included in this program.
d. What is the lost rate by tool type?
e. What is the breakage rate by tool type?
f. Use the approved DOD IG formula to determine payback for warranted tools.
g. Other areas that you feel should be considered.

2. Recommend you solicit help from the four MDEP field activities to provide the necessary data to complete this project. Your data should be formatted and forwarded to HQ USAF/LETN in the following sequence if this project supports the use of warranty tools in vehicle maintenance:

a. Aggregate Group Composition.
b. Failure Rate Computation.
c. Warranted Tool Cost Estimate.
d. Warranted Tool Data Summary.
e. DOD IG Formula.
f. Aggregate Group Payback.
g. References.

3. Please advise is more information is needed.

FOR THE CHIEF OF STAFF

JOHN A. REIDY, JR., Colonel, USAF
Chief, Vehicle & Equipment Division
Directorate of Transportation

cc: WR-ALC/MMTV
HQ USAF/LEYS

ATCH 3

DEPARTMENT OF THE AIR FORCE
AIR FORCE LOGISTICS MANAGEMENT CENTER
GUNTER AIR FORCE STATION, ALABAMA 36114

16 JAN 1984

Brigadier General John E. Griffith
Director of Transportation
Headquarters USAF (LET)
Washington DC 20330

Dear General Griffith

Our Warranted Handtool Project has proved that purchasing high-quality, industrial strength handtools will pay dividends within aircraft maintenance (Attachment 1). We also believe there are benefits to be gained from using warranted tools in other industrial areas; i.e., Transportation, Civil Engineers, etc. I tasked my staff to determine which tools on our listing could apply to transportation activities. We found at least 147 of the 222 line items in the program could apply.

The original Air Force contract allowed only jet engine shops to purchase warranted tools. In coordination with HQ USAF/LEY, we have expanded the contract to allow all aircraft, missile, and munitions maintenance activities to participate in this program. We think the next evaluation of this program should include other maintenance functions where an improved quality tool is economically justified.

There are, as always, some preliminary hurdles which must be overcome before the contract can be further expanded. The most critical is that future users of warranted tools be able to demonstrate a policy of strict tool control. The DoD/IG has closely monitored this aspect of our project from the start and insists that only those maintenance disciplines that have a reliable and auditable tool control program be included. A composite tool kit (CTK) program is a must. A second hurdle is that the bases requiring warranted handtools must be identified. We have identified 196 locations where aircraft maintenance functions require these tools, and this list could serve as a basis for your own. The third item necessary for entering this program is that anticipated quantities of needed tools be forecast in order that contracting and the suppliers agree on the lowest possible price. The forecast of yearly quantities for aircraft maintenance activities required considerable effort over a six months period.

Essentially, this program offers you important new options in the continual development of your maintenance technician's capabilities, professionalism, and morale. We are starting to receive telephone and written inquiries from the field (Attachment 2) and stand ready to work closely with your staff to establish a program which fits your needs. Our points of contact are Maj Dan King or Lt Col Walt Dzialo, AUTOVON 446-4464.

Best regards

KEITH E. BURRES
Colonel, USAF
Commander

22

2 Atch
1. Point Paper
2. HQ USAFE Msg

ATCH 4

END

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